

(12) INTERNATIONAL APPEICTION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
5 August 2004 (05.08.2004)

PCT

(10) International Publication Number
WO 2004/065530 A3

(51) International Patent Classification⁷: C10M 159/12, 145/20, 149/14, 129/54, 133/12, 133/14, 129/14, 133/02

(74) Agents: MUNSON, Jeffrey, F. et al.; The Lubrizol Corporation, 29400 Lakeland Boulevard, Wickliffe, OH 44092-2298 (US).

(21) International Application Number:

PCT/US2004/001442

(22) International Filing Date: 21 January 2004 (21.01.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/441,516 21 January 2003 (21.01.2003) US

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (for all designated States except US): THE LUBRIZOL CORPORATION [US/US]; 29400 Lakeland Boulevard, Wickliffe, OH 44092-2298 (US).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): CRESSEY, David [GB/GB]; 27 Bradwell Way, Belper, Derbyshire DE56 1NJ (GB). PRICE, David [GB/GB]; 19 Ambervale Close, Littleover, Derbyshire DE23 7YB (GB). FRIEND, Christopher, L. [GB/GB]; 37 Plantation Side, Bobbers Mill, Nottinghamshire NG7 5NR (GB). CARRICK, Virginia, A. [US/US]; 11500 Boxwood Circle, Chardon, OH 44024 (US). MORETON, David, J. [GB/GB]; Chevin Brae, Chevin Road, Milford, Belper, Derbyshire DE56 0QH (GB). DURHAM, John, D., [GB/GB]; 33 Nailers Way, Belper, Derbyshire DE56 0HT (GB). MCATEE, Rodney, J., [GB/GB]; 10 Maidwell Close, Belper, Derbyshire DE56 1TE (GB). SUTTON, Michael [GB/GB]; Rose Cottage, Whitelea Lane, Tansley, Matlock, Derbyshire DE4 5FL (GB).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
24 February 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/065530 A3

(54) Title: SULPHUR FREE COMPOSITION AND LUBRICANT COMPOSITION AND METHODS THEREOF

(57) Abstract: A composition comprises a sulphur free reaction product of: (a)(i) a hydrocarbyl substituted aromatic compound containing an acidic group selected from the group consisting of a carboxylic group, a hydroxyl group and mixtures thereof; and (a)(ii) an organic nitrogen-containing base reacted with the acidic group. The composition is obtained by a preparatory process and is useful in a method for lubricating an internal combustion engine to include where the lubricant has reduced levels of sulphur, phosphorus and sulphated ash.

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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C10M159/12 C10M145/20 C10M149/14 C10M129/54 C10M133/12
 C10M133/14 C10M129/14 C10M133/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C10M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 688 751 A (CLEVELAND WILLIAM K S ET AL) 18 November 1997 (1997-11-18) cited in the application claim 1; examples 4-6,18,20 -----	1-6,8,9, 12,16-20
X	US 5 827 805 A (ADAMS PAUL E ET AL) 27 October 1998 (1998-10-27) column 9, line 65 - column 13, line 19; claims 31,37; examples 12-15,27,28 -----	1-5,9-20
X	US 5 330 666 A (HABEEB JACOB J) 19 July 1994 (1994-07-19) column 1, lines 41-44; claims 1-5 column 4, lines 3-21; examples 1,2 ----- -/-	1-6,8,9, 11,14-20

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *O* document referring to an oral disclosure, use, exhibition or other means
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T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

2 December 2004

Date of mailing of the international search report

14.12.04

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Kazemi, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/001442

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 290 463 A (HABEEB JACOB J) 1 March 1994 (1994-03-01) the whole document column 1, lines 44-47; claims 1-12 column 3, line 64 - column 4, line 21; examples 1,2 -----	1-6,8,9, 11,13-20
X	US 4 090 971 A (HOKE DONALD IRVIN) 23 May 1978 (1978-05-23) column 2, line 52 - column 5, line 10 column 10, lines 38-56 column 12, lines 11-26 column 15, lines 10-42; claims 1,4; examples 1-9,12,13 -----	1-6,8-20
X	US 3 362 801 A (FARERI ELIZABETH L ET AL) 9 January 1968 (1968-01-09) the whole document -----	1,3,6,8, 9,16-18
X	US 5 089 158 A (VAN KRUCHTEN EUGENE M G A ET AL) 18 February 1992 (1992-02-18) column 4, line 42 - column 5, line 21; examples 1,2; tables 1-4 -----	1-4,6,8, 9,11,12, 16-20
X	WO 02/072529 A (LUBRIZOL CORP) 19 September 2002 (2002-09-19) page 1, lines 5-9 page 15, lines 22-29 page 20, line 24 - page 21, line 17; claim 1; example 2 -----	1-9, 16-19
X	GB 455 304 A (DU PONT) 19 October 1936 (1936-10-19) page 3, lines 17,18,58-70 -----	1,6,16
A	GB 1 121 681 A (LUBRIZOL CORP) 31 July 1968 (1968-07-31) page 1, lines 19-42; example 4 -----	1,6,9, 11,16-20
X	EP 0 727 477 A (BP CHEMICALS ADDITIVES) 21 August 1996 (1996-08-21) page 5, lines 23-41; examples -----	1-4,6, 9-20
X	US 6 331 510 B1 (LAMB GORDON D ET AL) 18 December 2001 (2001-12-18) column 11, line 22 - column 12, line 15; claim 1 -----	1-3,6,9, 16-20
X	DD 264 446 A (LEUNA WERKE VEB) 1 February 1989 (1989-02-01) claims 1,4,7,9 -----	1-3,6,9, 11,13, 16-19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/001442

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-5,6(part),7(part),8-20,21(part),22

A lubricant composition comprising a sulphur-free reaction product of an organic N-containing base and a single or multiaromatic compound having both a hydroxy and a carboxylic acid group (claim 6: alternatives a(i)(1) and (3))

2. claims: 1-5,6(part),7(part),9-20,21(part),22

A lubricant composition comprising a sulphur-free reaction product of an organic N-containing base and a single or multiaromatic compound having both an amino and a carboxylic acid group (claim 6: alternatives a(i)(2) and (4))

3. claims: 1-5,6(part),9-20,22

A lubricant composition comprising a sulphur-free reaction product of an organic N-containing base and condensed phenol (claim 6: alternative a(i)(5))

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/001442

Patent document cited in search report	Publication date		Patent family member(s)		Publication date
US 5688751	A	18-11-1997	DE DE EP JP	69717361 D1 69717361 T2 0824143 A1 10088165 A	09-01-2003 04-09-2003 18-02-1998 07-04-1998
US 5827805	A	27-10-1998	NONE		
US 5330666	A	19-07-1994	CA DE DE WO EP JP	2156608 A1 69403322 D1 69403322 T2 9419434 A1 0684978 A1 9504040 T	01-09-1994 26-06-1997 16-10-1997 01-09-1994 06-12-1995 22-04-1997
US 5290463	A	01-03-1994	CA DE DE WO EP JP	2156606 A1 69404447 D1 69404447 T2 9419437 A1 0684979 A1 9502422 T	01-09-1994 28-08-1997 15-01-1998 01-09-1994 06-12-1995 11-03-1997
US 4090971	A	23-05-1978	NONE		
US 3362801	A	09-01-1968	NONE		
US 5089158	A	18-02-1992	GB	2235695 A	13-03-1991
WO 02072529	A	19-09-2002	US CA EP JP WO US	6596038 B1 2440202 A1 1368447 A1 2004532297 T 02072529 A1 2004123514 A1	22-07-2003 19-09-2002 10-12-2003 21-10-2004 19-09-2002 01-07-2004
GB 455304	A	19-10-1936	US	2066173 A	29-12-1936
GB 1121681	A	31-07-1968	DE FR	1594469 A1 1457520 A	04-02-1971 24-01-1966
EP 0727477	A	21-08-1996	DE DE EP JP US	69612026 D1 69612026 T2 0727477 A2 8245474 A 5780403 A	19-04-2001 18-10-2001 21-08-1996 24-09-1996 14-07-1998
US 6331510	B1	18-12-2001	CA EP JP WO US	2437624 A1 1362088 A2 2004524402 T 02064709 A2 2002151445 A1	22-08-2002 19-11-2003 12-08-2004 22-08-2002 17-10-2002
DD 264446	A	01-02-1989	DD	264446 A1	01-02-1989

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